II. AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions, and listings, of claims in the application:

1. (Currently amended)   A method for correcting a deviation of a dimension of a feature from a target in a semiconductor process, the method comprising the steps of:

first measuring the feature prior to conducting a process relative to the feature to obtain an incoming feature dimension;

conducting the process based on a process model;

second measuring the feature after conducting the process to obtain an outgoing feature dimension;

determining an origin of any deviation of the outgoing feature dimension from a target structure dimension, wherein the determining includes:

conducting the process on a first process reference wafer of a process reference wafer set, each process reference wafer of the set having been generated at a first point in time;

establishing a baseline outgoing feature dimension of the feature from the first process reference wafer at the first point in time;

conducting the process on a second process reference wafer of the process reference wafer set at a later second point in time;

measuring an outgoing feature dimension of the feature on the second process reference wafer; and

determining whether a deviation exists between the baseline outgoing feature dimension and the outgoing feature dimension of the second process reference wafer; and

adjusting, according to the origin, at least one of the measuring steps and the process conducting step to correct for any deviation.

2. (Original)   The method of claim 1, wherein the method is carried out on at least one of: a wafer-by-wafer (W2W) basis; a lot-by-lot (L2L) basis; a with-in-wafer (WIW) basis; and a with-in-die (WID) basis.

3. (Currently amended)   The method of claim 1, wherein the determining step includes[[:]]

~~conducting the process on a first process reference wafer of a process reference wafer set, each process reference wafer of the set having been generated at a first point in time;~~

~~establishing a baseline outgoing feature dimension of the feature from the first process reference wafer at the first point in time;~~

~~conducting the process on a second process reference wafer of the process reference wafer set at a later second point in time;~~

~~measuring an outgoing feature dimension of the feature on the second process reference wafer;~~

~~determining whether a deviation exists between the baseline outgoing feature dimension and the outgoing feature dimension of the second process reference wafer; and~~

in the case that a deviation exist, determining that the origin is the first measuring step, and in the case that a deviation does not exist, determining that the origin is at least one of the

processing step and the first measuring step.

4. (Original)   The method of claim 3, wherein in the case that a deviation exists, further determining whether the deviation is equivalent to a production wafer deviation generated on a production wafer.

5. (Original)   The method of claim 4, further comprising the step of providing a measurement reference wafer set for each measurement tool used to conduct the measuring steps and a measurement baseline for the measurement reference set; and

wherein in the case that the deviations are not equivalent, conducting a measurement test of at least one measuring tool used to conduct at least one of the measuring steps, and comparing results of the measurement test versus the measurement baseline for that measurement tool to determine whether an inaccuracy exist.

6. (Original)   The method of claim 5, wherein in the case that an inaccuracy exists in a measurement tool for the first measuring step, determining that the origin is that measurement tool, otherwise determining the origin is a state of an incoming wafer; and

wherein in the case that an inaccuracy exists in a measurement tool for the second measuring step, determining that the origin is that measurement tool, otherwise excluding that measurement tool as the origin.

7. (Original)   The method of claim 1, wherein at least one of the first and second measuring

steps includes adjusting a respective feature dimension to address at least one of: a calibration adjustment and a wafer state deviation.

8. (Original) The method of claim 1, further comprising the step of feeding forward a process model adjustment to the process conducting step for the process model to address any deviation of the first measurement from the target structure dimension based on the first measurement.

9. (Original) The method of claim 1, wherein the process model includes a process recipe setting needed to achieve the target dimension from the incoming feature dimension.

10. (Original) The method of claim 1, wherein the measuring steps are carried out using a standalone metrology tool.

11. (Currently amended) A system for correcting a deviation of a dimension of a feature from a target in a semiconductor process, the system comprising:

    means for first measuring the feature prior to conducting a process relative to the feature to obtain an incoming feature dimension;

    means for conducting the process based on a process model;

    means for second measuring the feature after conducting the process to obtain an outgoing feature dimension;

    means for determining an origin of any deviation of the outgoing feature dimension from a target structure dimension, wherein the determining means includes means for determining

whether a deviation exists between a baseline outgoing feature dimension of a first process reference wafer that has been run through the process conducting means at a first point in time, and an outgoing feature dimension of a second process reference wafer of the process reference wafer set that has been run through the process conducting means at a later second point in time; and

       means for adjusting, according to the origin, at least one of the measuring means and the process conducting means to correct for any deviation.

12. (Currently amended)   The system of claim 11, further comprising a process reference wafer set including a plurality of process reference wafers that have been generated together, the process reference set including [[a]]the first process reference wafer that has been run through the process conducting means at [[a]]the first point in time, and [[a]]the baseline outgoing feature dimension of the feature from the first process reference wafer has been established at the first point in time.

13. (Currently amended)   The system of claim 12, wherein the determining means includes[[:]]

      ~~means for determining whether a deviation exists between the baseline outgoing feature dimension and an outgoing feature dimension of a second process reference wafer of the process reference wafer set that has been run through the process conducting means at a later second point in time; and~~

      means for determining that the origin is the first measuring means in the case that a

deviation exist, and determining that the origin is at least one of the process conducting means and the first measuring means in the case that a deviation does not exist.

14. (Original) The system of claim 13, wherein each process reference wafer set includes a set of one of: patterned wafers and blanket wafers.

15. (Original) The system of claim 13, wherein in the case that a deviation exists, the determining means further determines whether the deviation is equivalent to a deviation generated on a production wafer.

16. (Original) The system of claim 15, further comprising a measurement reference wafer set for each measurement means including a measurement baseline; and

wherein in the case that the deviations are not equivalent, the determining means further conducts a measurement test of at least one measuring means, and compares results of the measurement test versus the measurement baseline for that measuring means to determine whether an inaccuracy exist.

17. (Original) The system of claim 16, wherein in the case that an inaccuracy exists in the first measuring means, the determining means determines that the origin is the first measuring means, and in the case that an inaccuracy does not exist in the first measuring means, determines the origin is a state of an incoming wafer; and

wherein in the case that an inaccuracy exists in the second measuring means, the

determining means determines that the origin is the second measuring means, and in the case that an inaccuracy does not exist in the second measuring means, excludes the second measuring means as the origin.

18. (Original) The system of claim 11, further comprising means for feeding forward a process model adjustment to the process conducting means for the process model to address any deviation of the first measurement from the target structure dimension based on the first measurement.

19. (Original) The system of claim 11, wherein the process model includes a process recipe setting needed to achieve the target structure dimension from the incoming feature dimension.

20. (Original) The system of claim 11, wherein the system is applied on at least one of: a wafer-by-wafer (W2W) basis; a lot-by-lot (L2L) basis; a with-in-wafer (WIW) basis; and a with-in-die (WID) basis.

21. (Original) The system of claim 11, wherein at least one of the measuring means includes a standalone metrology tool.

22. (Currently amended)   A computer program product comprising a computer useable medium having computer readable program code embodied therein for correcting a deviation of a dimension of a feature from a target in a semiconductor process, the program product

comprising:

program code configured to control means for first measuring the feature prior to conducting a process relative to the feature to obtain an incoming feature dimension;

program code configured to control a processing tool that conducts the process based on a process model;

program code configured to control means for second measuring the feature after conducting the process to obtain an outgoing feature dimension;

program code configured to determine an origin of any deviation of the outgoing feature dimension from a target structure dimension, wherein the determining code includes program code for determining whether a deviation exists between a baseline outgoing feature dimension of a first process reference wafer that has been run through the process conducting means at a first point in time, and an outgoing feature dimension of a second process reference wafer of the process reference wafer set that has been run through the process conducting means at a later second point in time; and

program code configured to generate an adjustment, according to the origin, for at least one of the measuring means and the processing tool to correct for any deviation.

23. (Currently amended) The program product of claim 22, further comprising a process reference wafer set including a plurality of process reference wafers that have been generated together, the process reference set including [[a]]the first process reference wafer that has been run through the process conducting means at [[a]]the first point in time, and [[a]]the baseline outgoing feature dimension of the feature from the first process reference wafer has been

established at the first point in time.

24. (Currently amended)   The program product of claim 23, wherein the determining code
includes[[:]]

~~program code configured to determine whether a deviation exists between the baseline~~
~~outgoing feature dimension and an outgoing feature dimension of a second process reference~~
~~wafer of the process reference wafer set that has been run through the processing means at a later~~
~~second point in time; and~~

program code configured to determine that the origin is the first measuring means in the
case that a deviation exist, and determine that the origin is at least one of the processing means
and the first measuring means in the case that a deviation does not exist.

25. (Original) The program product of claim 24, wherein in the case that a deviation exists, the
determining code further determines whether the deviation is equivalent to a production wafer
deviation generated on a production wafer.

26. (Original)   The program product of claim 25, further comprising a measurement reference
wafer set for each measuring means including a measurement baseline; and

wherein in the case that the deviations are not equivalent, the determining code further
conducts a measurement test of at least one of the measuring means, and compares results of the
measurement test versus the measurement baseline for that measuring means to determine
whether an inaccuracy exist.

27. (Original) The program product of claim 26, wherein in the case that an inaccuracy exists in the first measuring means, the determining code determines that the origin is the first measuring means, and in the case that an inaccuracy does not exist in the first measuring means, determines the origin is a state of an incoming wafer; and

wherein in the case that an inaccuracy exists in the second measuring means, the determining code determines that the origin is the second measuring means, and in the case that an inaccuracy does not exist in the second measuring means, excludes the second measuring means as the origin.

28. (Original) The program product of claim 22, further comprising program code configured to feed forward a process model adjustment to the process conducting program code for the process model to address any deviation of the first measurement from the target structure dimension based on the first measurement.

29. (Original) The program product of claim 22, wherein the process model includes a process recipe setting needed to achieve the target structure dimension from the incoming feature dimension.

30. (Original) The program product of claim 22, wherein at least one of the measuring means includes a standalone metrology tool.